USAID FROM THE AMERICAN PEOPLE | MUNICIPAL ENERGY REFORM IN UKRAINE

Low Emissions Development Strategies Training Series

Module 4:
LEDS Policy Options Selection & Design

The Center for Climate Strategies

Kiev, June 2015

LEDS Process

Step 1	Organization and Goals
Step 2	Baseline Development
Step 3	Policy Options Identification
Step 4	Policy Screening & Prioritization
Step 5	Initial Policy Option Design Specifications
Step 6	Direct (Micro) Impacts Assessment
Step 7	Policy Options Integration and Overlap
Step 8	Indirect (Macro) Impacts Assessment
Step 9	Final Recommendations & Report Transmittal
Step 10	Monitoring, Reporting, Evaluation, & Updating

Policy Selection & Design

Topics

1. Assessing a menu of potential LEDS policy options and mechanisms (sector specific and cross cutting options catalogs or databases)
2. Screening-level assessment and prioritization of options for goal alignment (i.e. Economic, Energy, Environment (E3) potential)
3. Policy Option and Mechanism design strategies and specifications for each sector based and cross cutting action

Learning Objectives

1. Screen, prioritize and then jointly-establish specific and sector-based draft E3 Policy Option priorities for each sector
2. Develop Policy Option designs and mechanisms, iteration procedures, design alternatives, and agreements

Background Concepts

- Limits on the number of options, depth of analysis to meet capacity constraints of the LEDS Action Plan process
- Performance and screening criteria
- “Design to Win” LEDS E3 strategies for each sector
- Targeting and prioritization process
- Policy option and mechanism design parameters
- Links to analysis and performance
- Draft policy option/mechanism design process
- Draft analysis and design iterations

Capacity Issues

- A top set of policies in each sector is needed to address LCD planning goals
- Total number of options typically include up to ten in each sector, or potentially 50 overall
- In-depth feasibility analysis is needed for each option and all integrated together
- Time and resource requirements are high, including staffing and work groups
- Rigorous screening and design of options increases their quality and likelihood of successful implementation

Policy Selection Criteria

- Match planning objectives
- Strategic in nature
- Meet implementation feasibility needs
- Measurable by benchmarks or expert ranks
- Manageable through policy option design
- Practical in terms of number and complexity

Screening Process

Stepwise framework for screening:

1. Assemble a complete list of policy options/mechanisms for each sector
2. Determine appropriate screening criteria
3. Populate a matrix with benchmark or expert ratings for each criterion
4. Evaluate results using multi-criteria analysis
5. Iterate through group review, discussion, modifications if/as needed
6. Select priorities

Policy Catalogs

Policy Number	Low Carbon Development Policy	Upper Limit (%) of 2035 BAU GHG 7,210 Tg CO2e BAU GHG	Realistic Screening Potential (%) of 2035 BAU GHG	Micro-economic Costs/ Savings Indicator	Potential Macroeconomic Impact by 2035		Potential Impacts on Local Health and Environment	2035 Carbon Intensity Screening 336 g CO2e/ ¥2010	Potential Impacts on Clean Energy Goals
					Gross State Product	Employ-ment			
Group 1: RENEWABLE ENERGY									
ES-1a	Renewable Portfolio Standard	3.8%	1.2%	500	+	+	+	4.2	+
ES-1b	Green Power Purchases and Marketing	3.8%	1.9%	400	U	U	+	6.3	+
ES-1c	Grid Based Renewable Incentives or Barrier Removal	0.001%	0.001%	350	U	U	+	0.004	+
ES-1d	Offshore Wind Development Issues	0	0	300	-	-	+	-	+
Group 2: ADVANCED FOSSIL ENERGY									
ES-2a	Advanced Fossil Fuel Technology Incentives, Support, or Requirements	1.1%	0.35%	250	-	-	+	1.2	+
ES-2b	Support Efficiency Improvements at Existing Fossil Fuel Power Plants	0.35%	0.17%	50	+	+	+	0.58	+
ES-2c	Support Repowering of Existing Plants (incentives/barrier removal)	1.7%	0.56%	300	+	+	+	1.9	+

Screening Tools

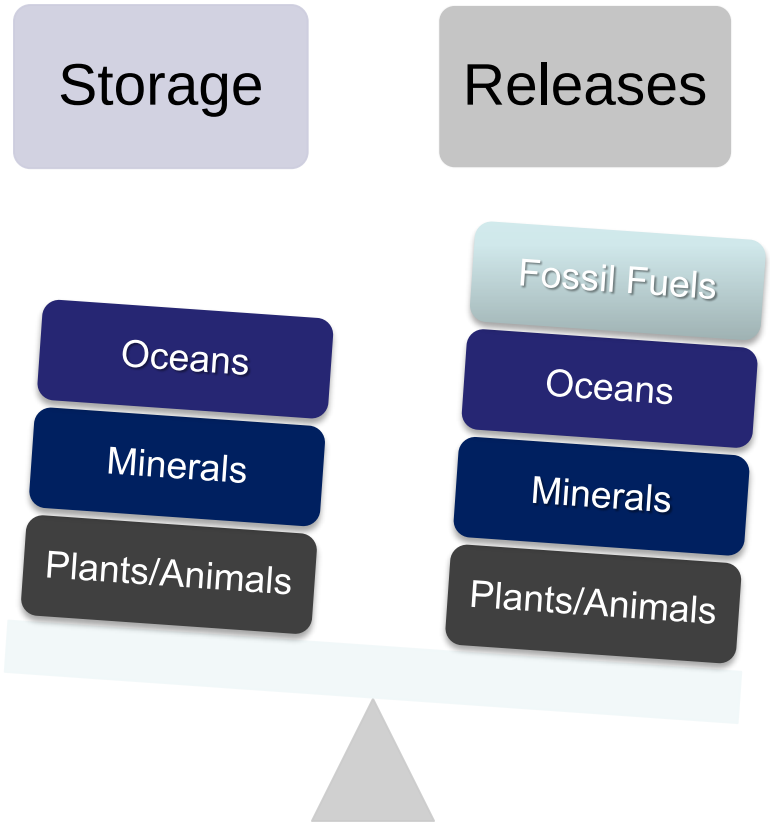
Multi-Criteria Analysis (MCA) -- screening and prioritization

- Spreadsheet based
- Supports group decisions and discussions
- Enables peer learning, exchange
- Reveals informed preferences
- Identifies synergies and comparative effects
- Enables conflict resolution, consensus
- Accommodates variations in values
- Objective but can use expert judgement where data are lacking: some combination of quantitative, semi-quantitative and qualitative analysis

LEDS Screening Metrics

GHG reduction potential, carbon intensity	• Options, Priorities, and Designs
Economic impacts, micro- and macro-scale	• Multi-benefits derived from policy selection & design
Energy security and sustainability	• Multi-benefits derived from policy selection & design
Environment, resource sustainability and efficiency	• Multi-benefits derived from policy selection & design
Equity, fairness for individuals, groups, locations	• Multi-benefits derived from policy selection & design

GHG Balance


Storage
Releases
Oceans
Minerals
Plants/Animals
Fossil Fuels
Oceans
Minerals
Plants/Animals

GHG Strategies

HEAT AND POWER

- Renewable and low emitting sources

RESIDENTIAL, COMMERCIAL, INSTITUTIONAL & INDUSTRIAL

- Efficiency, process improvements

TRANSPORTATION AND LAND USE

- Low carbon fuels, vehicle efficiency, community design

AGRICULTURE

- Bio energy, carbon storage, low input farming, feed efficiency

FORESTRY

- Bio energy, carbon storage, land restoration

WASTE

- Source reduction, recycling, energy recovery

Economic Expansion

Cost effective approaches increase economic efficiency and expansion

Energy savings cut energy costs, stimulate labor investment

Shifts to indigenous vs. imported resources cut job outflows

Actions supported by local supply chains cut job outflows

New investment from outside sources stimulates labor investment at home

Labor intensive activities create more jobs, even if at higher cost (up to a point)

Economic Transition

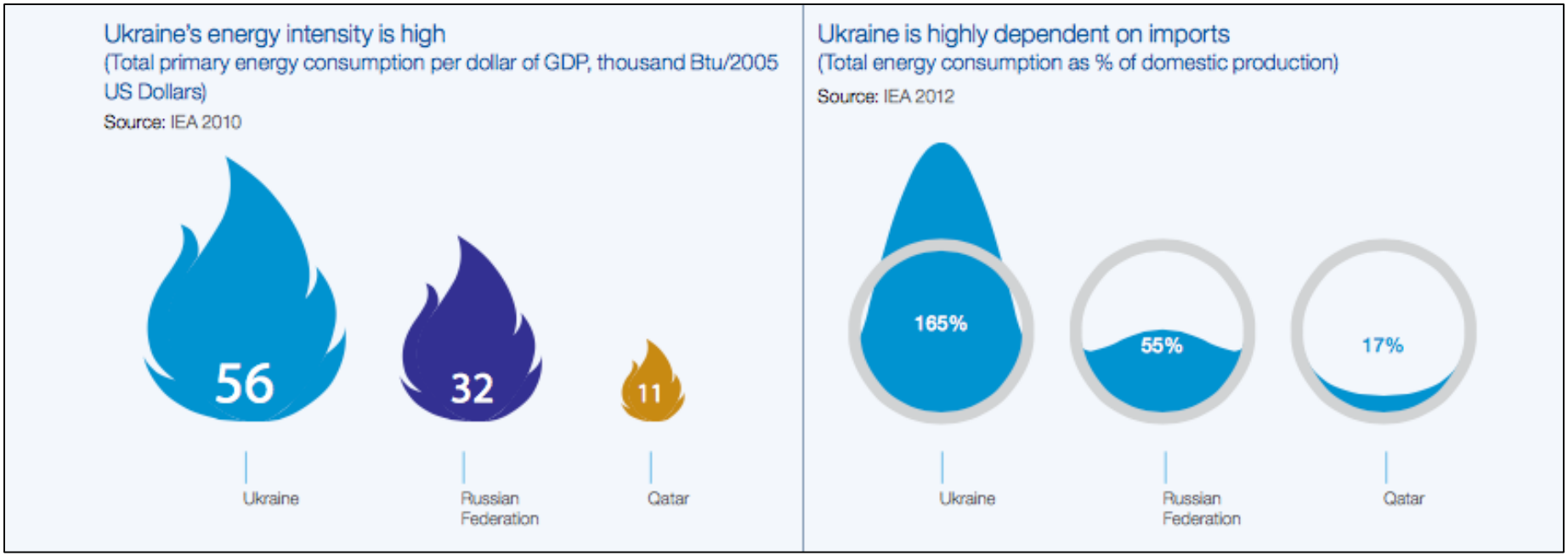
- Policy Framework, Barrier Removal
- Research and Demonstration
- Commercialization and Scale Up
- Secondary and Tertiary Production
- Sustainability and Exports

Energy Security

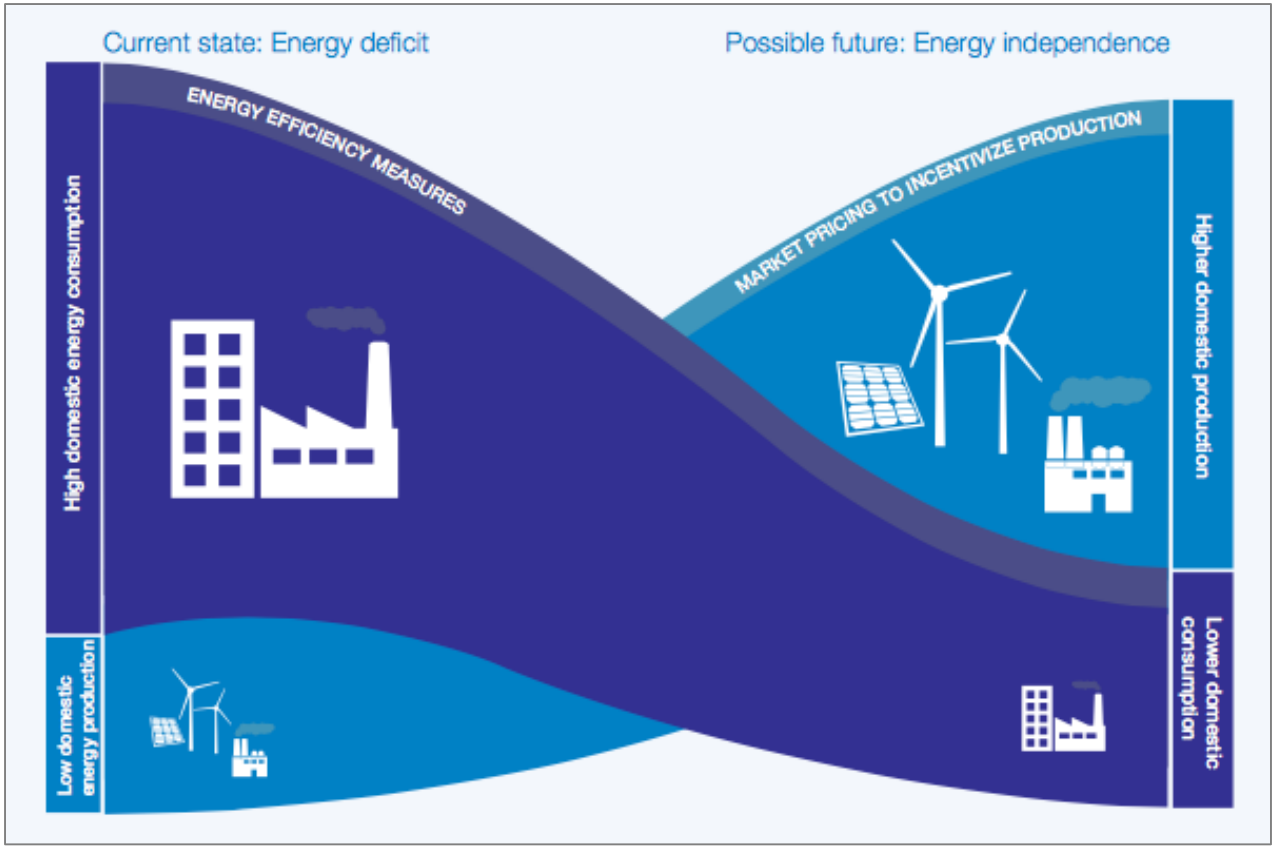
- Energy Intensity
- Fuel Diversity
- Electricity Diversity
- Grid Stability
- Access and Affordability
- Import Reduction

Ukraine Energy Imports

World Economic Forum (WEF) Scenarios for Ukraine, 2014



Energy Transition (WEF 2014)



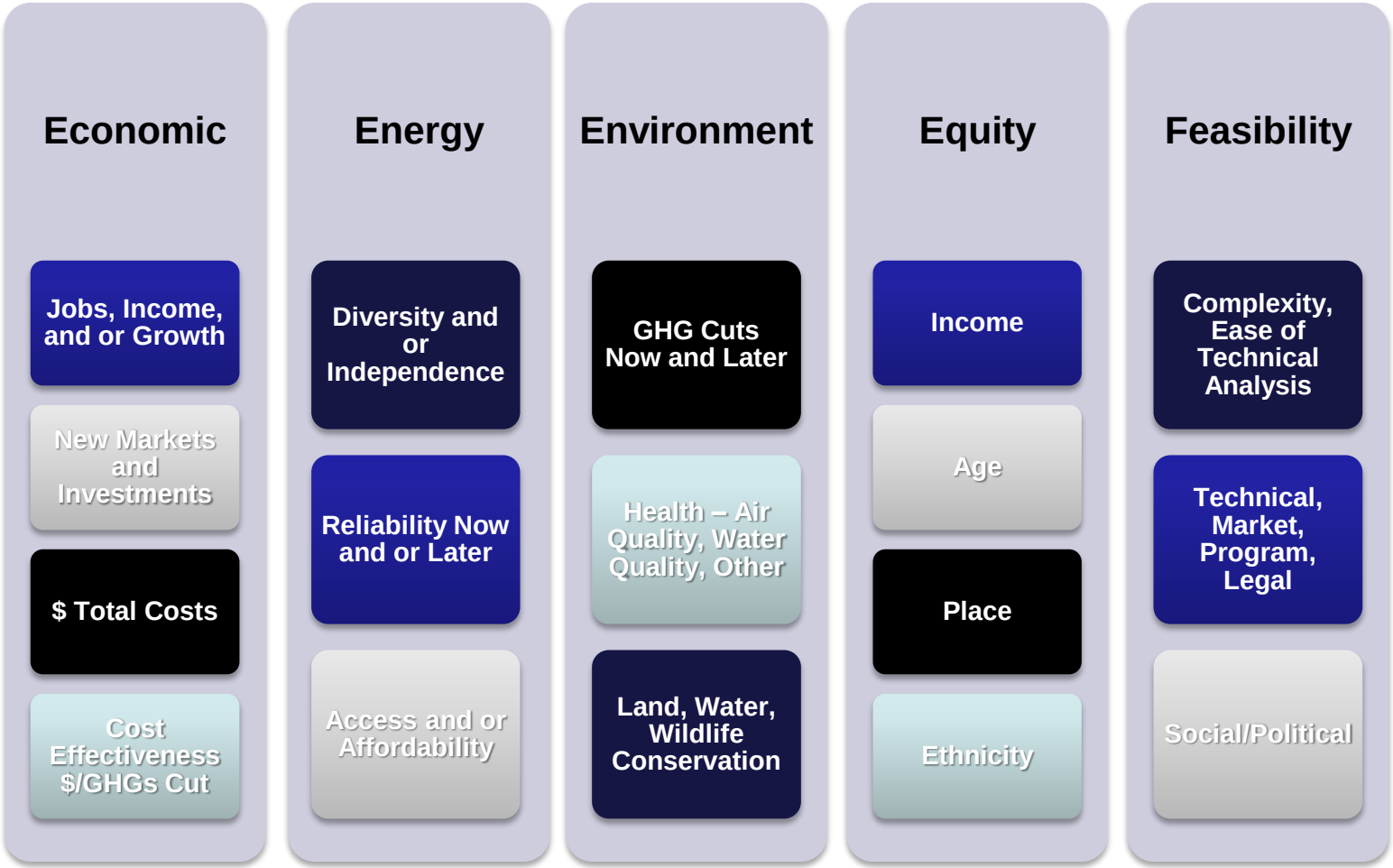
Resource Sustainability

Quantity/ Scarcity	Quality/ Health	Longevity/ Resilience
Service Value	Recovery	Renewability

Fairness and Equity

Wealth Status	Social Status	Generational
Business Size	Special Populations	Special Locations

Minnesota MCA



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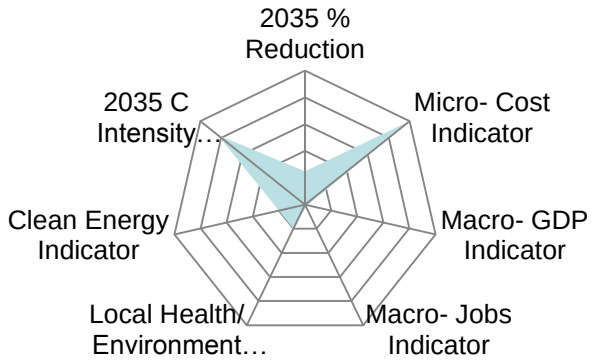
Minnesota MCA

Minnesota Climate Solutions and Economic Opportunities (CSEO) Project	Decision Criteria ➤	Complexity, Ease of Technical Analysis	GHG Cuts Now and or Later	$ Total Costs	Cost Effectiveness -- $/GHGs Cut	Jobs, Income, and or Growth	New Markets and or Investments	Energy Diversity and or Independence	Energy Reliability Now and or Later	Energy Access and or Affordability	Health -- AQ, WQ, or Other	Land, Water, and or Wildlife Conservation	Equity -- Income, Age, Place, and or Ethnicity	Feasibility -- Technical, Market, Program, Legal	Feasibilty -- Social/Political	# Ballots	Priority Ranking
2008 Options	Ranking Scheme ➤	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	H, M, L, U, or a range/combination	10 Ballots/Voter, 1 For Each Preference	Tiers 1, 2, 3
Option #, Sector	Ranking Scale ➤ Policy Option Description ↴	H = x... to y... (+/-) M = x... to y... (+/-) L = x... to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)	H = x to y... (+/-) M = x to y... (+/-) L = x to y... (+/-)		
ES 3	Efficiency Improvements, Repowering and Up Grades to Existing Plants																
ES	Increase RES																
ES	Increase Solar Standard																
ES/RCII	111(d) Scenario (Including Price and Non-Price Mechanisms)																

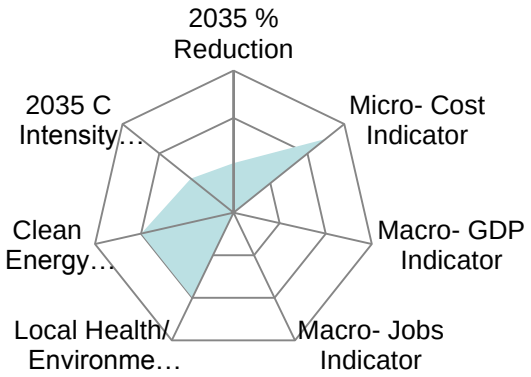
MN MCA Balloting Results

Policy Number	Decision Criteria ➤	Ease of Technical Analysis	Total GHG Cuts by 2025	$ Total Annual (Levelized) Costs	2020 Cost Effectiveness $/GHGs Cut	2020 Jobs, Income, and or Growth (Compared to Base)	Cobenefits 2025	Does the technology exist?	2020 Feasibilty -- Social/ Political	Agency experts commited?	# Ballots
16	Efficiency Improvements, Repowering and Up Grades to Existing Plants	L	L to H	High		U	U	U	low	PCA	7
29	Renewable chemicals or bio-products that displace fossil fuels	low					h	A range		DEED	5
30	Increase RES	high	high	low	high	high	high - fuel	high	medium	PCA	9
31	Water use/management and energy efficiency integration	M					H	M to H		MDH and DNR	6
32	Electric Vehicles/Zero Emission Vehicle Standard									DOT, PCA	3
33	Water Freight/Transportation										
34	Water Use and Treatment									MDH and Met Council	1
35	Increase Solar Standard	M	U	M-H	U	Medium	H	Yes		DEED	2
36	111(d) Scenario (Including Price and Non-Price Mechanisms)	unkown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	PCA	2
37	Increase EE Requirement	medium	medium	medium	high	high	high	medium	medium	PCA	3
38	Thermal Renewable Standard	H	H	medium	H	H	M	high	medium	PCA, DEED	2
39	Incentives and Resources to Promote Thermal Renewables	M	High	medium	H	H	M	high	High	DEED, DNR	5
40	Demand/response	M					H	H	H		3
41	Distributed Generation										
42	R&D on clean energy technology										
43	Carbon Tax like British Columbia									MPCA	2
44	Building Benchmarking										1
45	100% LED streetlights									DOT	3
46	Rural Propane Alternatives (ex. Rooftop solar thermal heaters, biomass to dry grains, TBD)									DEED, PCA, DNR	2

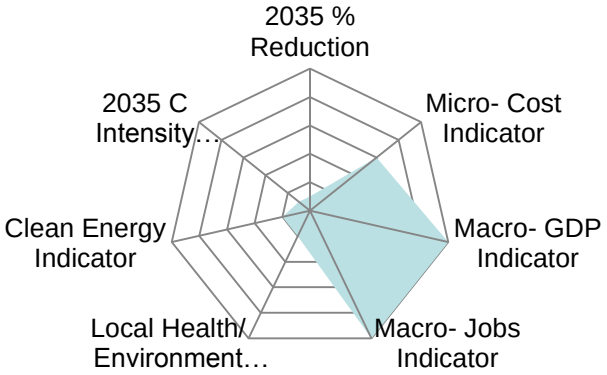
ES-1a



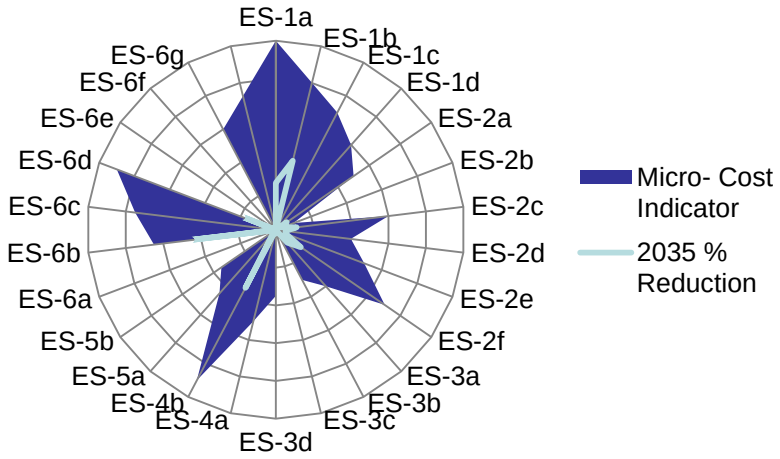
ES-3b



ES-1d



2035 % Reduction & Micro Cost Indicator



Iteration

- MCA steps include group review and discussion before and between steps
- Modifications to individual and group rankings of options can be made in response to group discussion
- Modifications can also be made to the lumping and splitting of options
- Second tier is available if First tier options don't pan out

MN Priority Options

Energy Supply (ES)

ES-1, Renewable Energy Standard

ES-2, Existing Power Plant Measures

ES-4, 111d Scenarios

Residential, Commercial, Industrial, Institutional (RCII)

RCII-1, CHP for Biomass, Gas

RCII-2, Zero Energy Ready Buildings SB 2030

A, Solar; B, Renewable and gas CHP

RCII-3, High Global Warming Gases

RCII-4, Increase EE Requirement

A, Electricity savings 2%; B, Gas savings

RCII-5, Promote Thermal Renewables

Transportation and Land Use (TLU)

TLU-1, Transportation Pricing

A, Pay as You Drive; B, Fuel Tax' C, Carbon' D, Per Mile Charges

TLU-2, Land Development, Urban Form

TLU-3, Met Council Draft 2040 Plan

A, Double transit ridership' B, Met pass lanes

TLU-4, EVs/Zero Emission Vehicle Standard

Forestry and Land Use (FOLU)

FOLU-1, Protect Peat Lands, Wetlands

FOLU-2, Manage for Productive Forests

A, Forest Thinning' B, Pest Detection and Treatment; C, Aspen Forest Regeneration

FOLU-3, Tree Planting: Urban areas

FOLU-4, Tree Planting: Ecosystems

FOLU-5, Conservation on Private Lands

A, Forest Conservation Easements 5 m acres' B, Grasslands and Woodlands Conservation 1.5 m acres' C, Health and Productivity on PNIFLs

Agriculture (A)

A-1, Nutrient Management

A-2, Soil Carbon Management/Health

A, Cover Cropping' B, Annual to Perennial Crops

A-3, Biochemicals, Bio-products Production

A-4, Advanced Biofuels Production

A-5, Existing Biofuels Statute (Consumption)

Waste Management (WM)

WM-1, Water use/management, EE

A, Municipal water conservation' B, Agriculture water management' C, Industrial Water Management

WM-2, WW Treatment & Electricity

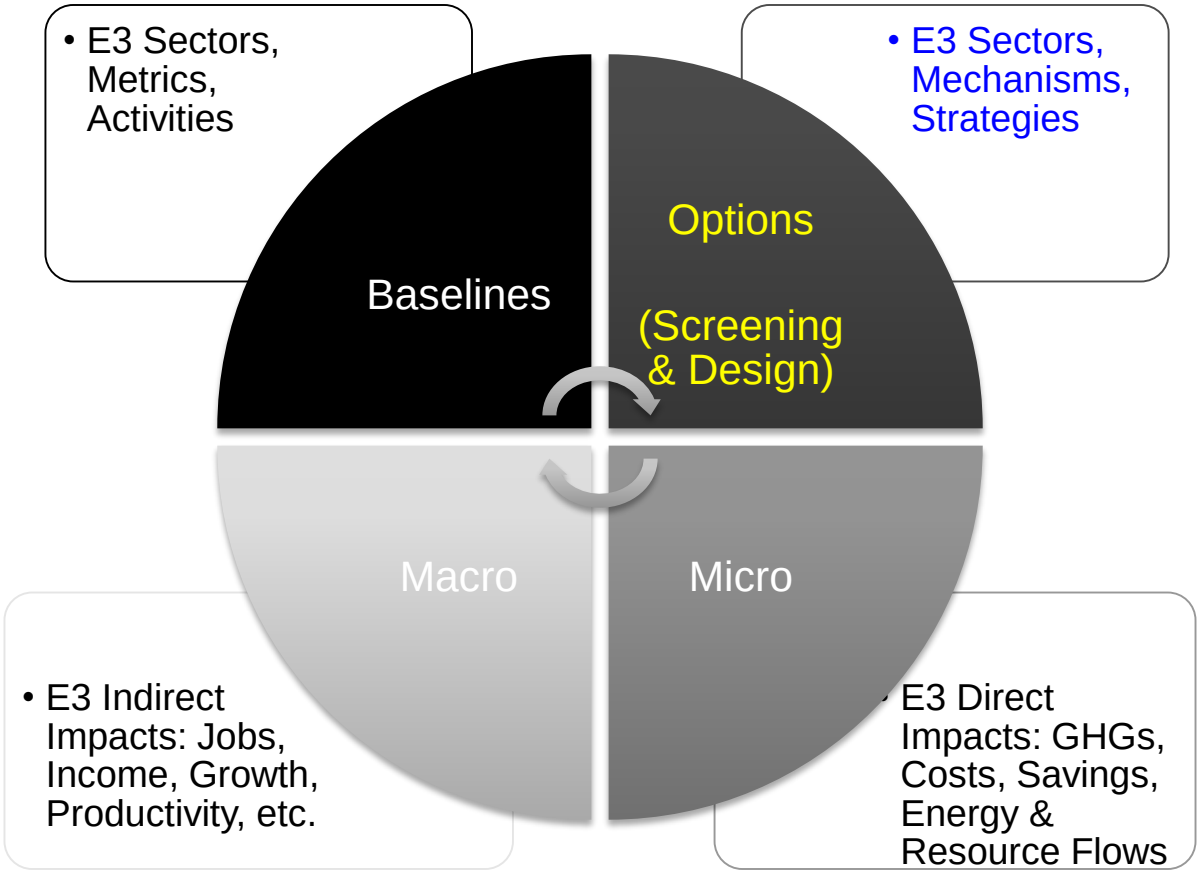
A, Efficiency of plants' B, Renewable energy at plants

WM-3, Front-End Waste Management

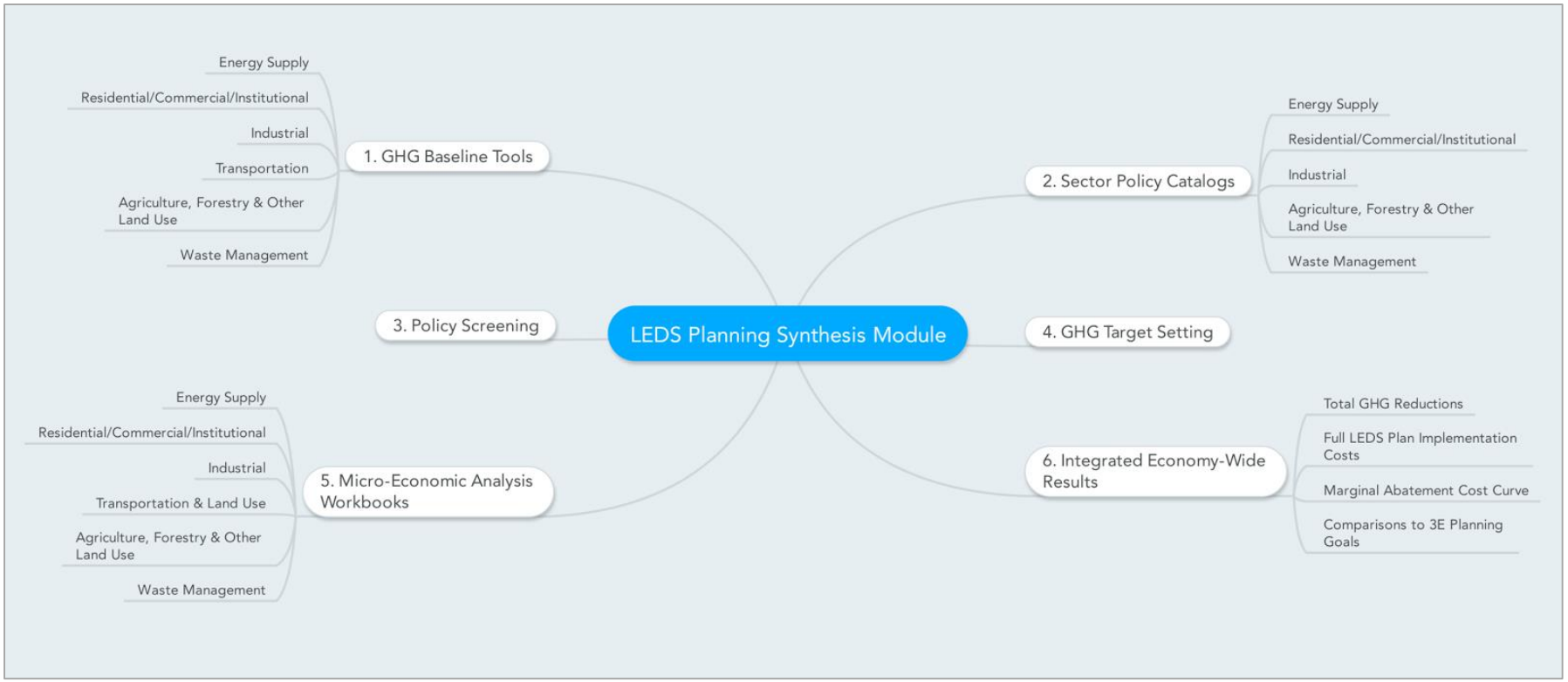
A, Source Reduction' B, Recycling' C, Composting' D, Re-Use

WM-4, Anaerobic Digestion Combined Wastes

MCA and Decision Process



MCA and Toolkit



Exercise

- CCS Review of MCA within the LEDS Toolkit Synthesis Module

- Sample survey of policy options/mechanisms rankings

Policy Option Design

1. Policy
   - ✓ Which Policies?
   - ✓ Which Design Specifications?
     - ✓ Timing, level of effort, coverage of parties, eligibility, etc.
     - ✓ Which Implementation Mechanisms? (Price vs. non price, mandatory vs. voluntary, incentives vs. rules, program, level of government, etc.)

2. Analysis
   - ✓ Which Data Sources?
   - ✓ Which Methods for Estimation of Impacts and Associated Uncertainty?
   - ✓ Which Key Assumptions?

Policy Description

- Policy Description (concept)
- Policy Design
  - Goals, timing, parties involved
  - Implementation Mechanisms
- Related Policies/Programs & Recent Actions
- Estimated Net GHG Reductions and Net Costs/Savings
  - direct impacts on energy, resources, and GHGs
  - a cost causal chain and analysis of direct costs or savings
- Key Uncertainties
- Additional Benefits and Costs, including indirect and macroeconomic effects
  - jobs, income, economic growth, prices, market share, etc.
- Feasibility Issues
- Status of Group Approval
- Level of Group Support
- Barriers to Consensus

Policy Description

Concise (2-3 paragraphs) covering:

- Source or aspect of the baseline addressed
  - Energy consumption
  - Energy generation
  - Management practice
  - Industrial process
- Significance of GHG source
  - e.g. contribution to current or 2025 forecasted emissions
- Recommended intervention
  - Energy efficiency measures
  - New clean energy generation capacity
  - Change in management practice or industrial process

Policy Description Example

Energy Supply Matrix, Baja, California (MLEDS)

"The current mix power generation relies largely on fossil fuels that generate GHG emissions and significantly deplete air quality. Due to high dependency on oil and the emissions which result from energy production in Baja California, there is a need for a policy that will diversify the energy matrix of the State to include a larger percent of renewable energy sources that do not affect the environment.

The State of Baja California has potential resources that can be utilized as for diversification of energy sources, such as: bioenergy, solar energy, geothermal energy, hydropower, wind power and various forms of ocean energy (tidal, waves and marine currents). The objective of this policy is to diversify the energy matrix, give greater stability, sustainability and increase supply current of energy, reduce hydrocarbons consumption and reduce Greenhouse Gas emissions."

Design Parameters

- Level of Effort (goals):
  - Renewable electricity generation capacity (example, giga-watts);
  - Reductions in BAU energy end-use (example, % of existing residential or commercial buildings)
  - Change in management (examples, hectares of reforestation, head of livestock addressed by manure anaerobic digestion)
- Timing:
  - Immediate, linear ramp-up, or lag period required
- Coverage of Parties
  - Implementing the policy
  - Affected by the policy

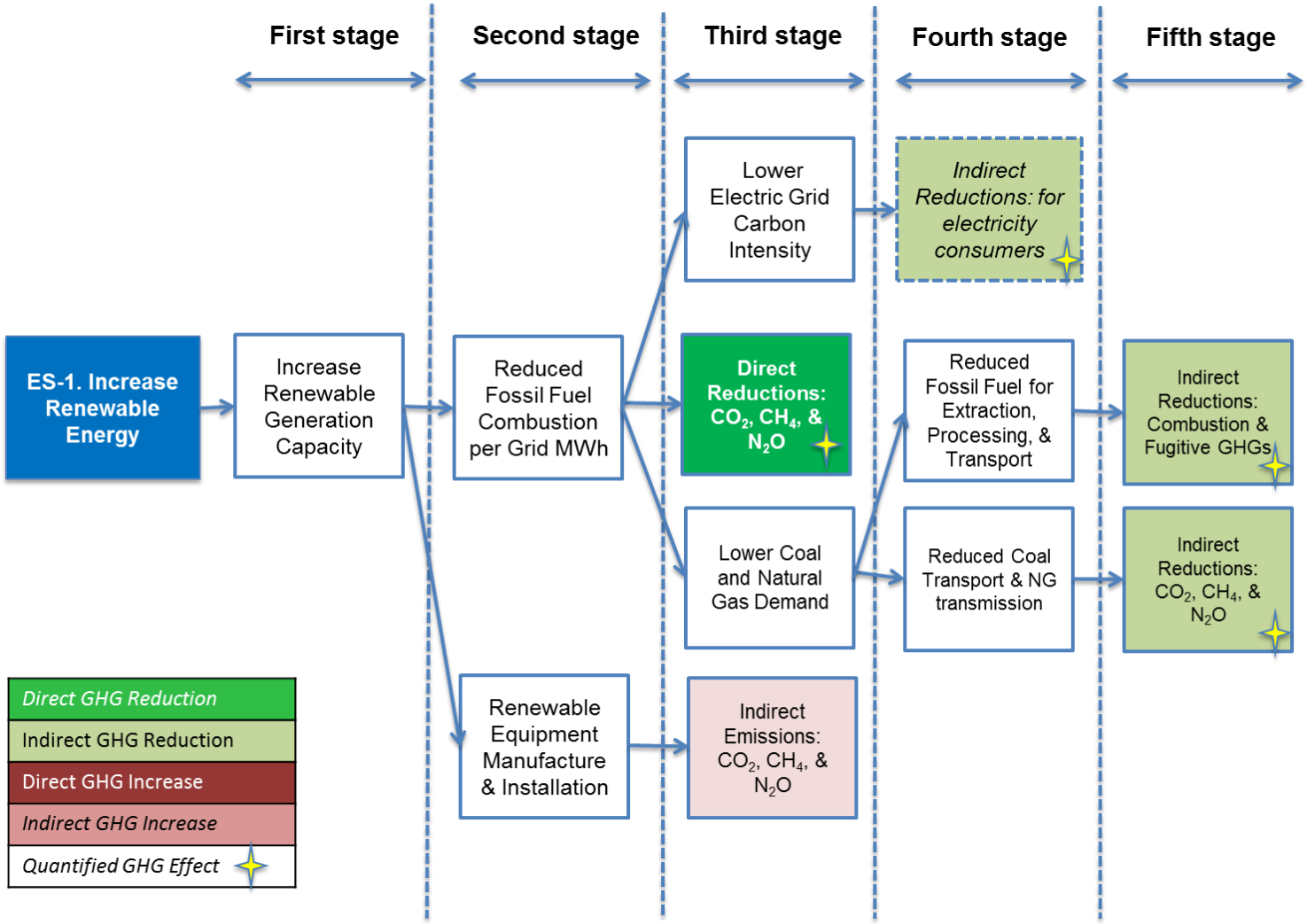
Design Parameters

- Eligibility and Definitions

- Implementation Mechanisms
  - Information and Education
  - Technical Assistance
  - Funding Mechanisms and/or Incentives
  - Codes and Standards
  - Voluntary or Negotiated Agreements
  - Market-based Mechanisms
  - Pilots and Demonstrations
  - Research and Development

Causal Chains

- Conceptual schematic:
  - intended policy effects
  - effects on GHGs, energy, economics, management practice, or other GHG-activity drivers
  - eventual GHG outcome(s): both positive and negative
- Identifies outcomes that will be quantified
- Ensures full understanding of impacts and points of intervention
- Builds off of the Policy Description and Design


First stage
Second stage
Third stage
Fourth stage
Fifth stage
ES-1. Increase Renewable Energy
Increase Renewable Generation Capacity
Reduced Fossil Fuel Combustion per Grid MWh
Renewable Equipment Manufacture & Installation
Lower Electric Grid Carbon Intensity
Direct Reductions: CO_2, CH_4, & N_2O
Lower Coal and Natural Gas Demand
Indirect Emissions: CO_2, CH_4, & N_2O
Indirect Reductions: for electricity consumers
Reduced Fossil Fuel for Extraction, Processing, & Transport
Reduced Coal Transport & NG transmission
Indirect Reductions: Combustion & Fugitive GHGs
Indirect Reductions: CO_2, CH_4, & N_2O
Direct GHG Reduction
Indirect GHG Reduction
Direct GHG Increase
Indirect GHG Increase
Quantified GHG Effect

Iteration

- Test design of options through draft analysis
- Identify performance shortcomings for each
- Identify alternate design and analysis approaches
- Reach group agreements on modifications
- Update design and analysis
- Iterate to acceptable performance results
- If/as needed update list of priorities for analysis

Policy Option Template

- Review an example completed State policy option template: Minnesota RCII-5. Thermal Renewables
- Focus on Design Specifications
- Review Implementation Mechanisms

Exercise

Identify starting places for macroeconomic expansion design for sample ES or RCII options

- National Heat and Power Supply Matrix
- National Electricity Demand Side Management Program

Summary

- LEDS Plans should be customized for the jurisdiction based on local needs and interests

- Specific LEDS policies should also be customized based on a number of factors, including:
  - Economic Security
  - Energy and Resource Security
  - Environmental and Health Gains
  - Equity and Fairness
  - Recent or planned actions
  - Local resources
  - Financing needs and other implementation requirements

Linkage to Analysis

- Module 5 will cover:
  - Direct (Microeconomic) Analysis
  - Indirect (Macroeconomic) Analysis

- An example policy design will be used to illustrate its use as the initial entry point to analysis

Thank you for your time and attention!

Questions?

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